

Space IoT takes off

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We know that current networks are not equipped to deal with the Internet of Things and the exponential growth in connected devices it entails. Whilst Low Power Wide Area (LPWA) technologies will be crucial to cope with future needs, experts increasingly look towards satellites as a complementary solution, especially for scarcely populated areas. The IoTEE project is proposing a receiver/emitter device to make space-based IoT a reality.

Although the project was kicked off in 2017, IoTEE's story goes all the way back to 2014 with the early development of TELDASAT – a low cost M2M communication service using existing space-based infrastructure to provide IoT communications. The point of this ESA-funded project? Coming first on a market set to count a total of 2 billion LPWA device units by 2022.

At the time, opting for terrestrial LPWA – a wireless technology specifically designed to enable low cost and long battery life, large coverage and high capacity for IoT applications – was a no brainer, especially when comparing it to big satellites positioned in high orbits. But things have been changing recently.

"Unlicensed technologies like Sigfox or Lora, or licensed ones like LTE-M or NB IoT were largely

preferred over large, expensive satellites," explains Philippe Moretto, CMO of SAT4M2M. "But thanks to an accelerated pace of innovation and dramatically dropping costs in the space sector thanks to the likes of small satellites of less than 50 kg, space-based IoT can now seriously be considered as a cost-effective alternative."

This is particularly true if you look outside future smart cities. As much as terrestrial technologies can be cost-efficient on the device front, setting up the network is expensive to the point where it can only make sense financially in the most densely populated areas. As Moretto points out, terrestrial networks currently cover about 2 % of the Earth's surface, so bringing IoT to everyone – a key ambition in the EU's digitalisation programme – would require closer integration between terrestrial and space technologies.

Since its creation, SAT4M2M has been building upon TELDASAT to develop the space segment of IoT, and the IoTEE project is an integrant part of this plan. Using the International Space Station (ISS) as a testbed for the first-ever LPWA satellite, it focuses on the development of a multi connectivity chip implementing a new communication protocol on the same frequency bands as Sigfox or Lora.

"Space LPWA is a complement to terrestrial LPWA. It's the realization of a truly global coverage, a network able to send several IoT messages per day using the ISS only. It is capable of managing simultaneously a high number of connections, and benefits from its small size, low cost and long autonomy – over 10 years. "All that has been achieved through several years of R&D expenses and patents," Moretto explains.

Space IoT is now considered as a "blue ocean" market opportunity by investors and the [space](#) industry alike. SAT4M2M intends to serve 1 million units, and the company has received support from ESA and NASA. Although the project won't end until January 2019, Moretto emphasizes how "the

first results have already confirmed our early expectations and even surpassed them." Whilst a launch date has yet to be announced by Airbus and Space X, he says that his company's focus is on delivering good preliminary services as soon as possible in partnership with FUJITSU Electronics.

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